

Claims

- [c1] 1. A cement composition comprising cement and low reactivity particles, wherein the particles have a size of about 40 mesh to about 250 mesh.
- [c2] 2. The composition of claim 1, wherein the composition fractures in a non-linear manner when set.
- [c3] 3. The composition of claim 1, wherein the cement is API Class A cement, API Class B cement, API Class C cement, API Class G cement, or API Class H cement.
- [c4] 4. The composition of claim 1, wherein the cement is ASTM class I cement, ASTM class II cement, ASTM class III cement, ASTM class IV cement, or ASTM class V cement.
- [c5] 5. The composition of claim 1, wherein the particles are silica sand.
- [c6] 6. The composition of claim 1, wherein the particles are aluminum silicate, gilsonite, ground coal, adamantane, or fullerene.
- [c7] 7. The composition of claim 1, wherein the particles are present at a concentration of about 30 weight percent to

about 100 weight percent, based on the weight of the cement.

[c8] 8. The composition of claim 1, further comprising water.

[c9] 9. The composition of claim 8, wherein the water is present at a concentration of about 30 weight percent to about 150 weight percent, based on the weight of the cement.

[c10] 10. The composition of claim 1, further comprising sand.

[c11] 11. The composition of claim 1, further comprising gravel.

[c12] 12. The composition of claim 1, further comprising a dispersant, a salt, a set retarder, a gas control agent, a free fluid control agent, a biopolymer, a weighting material, a fluid loss agent, a bonding agent, an extender, a reinforcing agent, or a gel.

[c13] 13. The composition of claim 12, wherein the weighting agent is hematite.

[c14] 14. The composition of claim 12, wherein the fluid loss agent is a hydroxyethylcellulose and AMPS copolymer.

[c15] 15. The composition of claim 12, wherein the bonding agent is polyvinyl alcohol.

- [c16] 16. The composition of claim 12, wherein the extender is sodium montmorillonite, sodium metasilicate, or sodium silicate.
- [c17] 17. The composition of claim 12, wherein the reinforcing agent is wollastonite, pyrophyllite, sepiolite, carbon whiskers, polypropylene whiskers, or nylon whiskers.
- [c18] 18. A cement composition comprising:
cement; and
silica sand having a size of about 40 mesh to about 250 mesh, wherein the silica sand is present at a concentration of about 30 weight percent to about 100 weight percent, based on the weight of the cement.
- [c19] 19. The composition of claim 18, further comprising water.
- [c20] 20. The composition of claim 18, further comprising water at a concentration of about 30 weight percent to about 150 weight percent, based on the weight of the cement.
- [c21] 21. A method of cementing an oil or gas well, the method comprising:
providing a cement composition comprising water, cement, and low reactivity particles, wherein the particles

have a size of about 40 mesh to about 250 mesh;
pumping the composition into the well; and
allowing the composition to set.

- [c22] 22. The method of claim 21, wherein the composition fractures in a non-linear manner when set.
- [c23] 23. The method of claim 21, wherein the water is present at a concentration of about 30 weight percent to about 150 weight percent, based on the weight of the cement.
- [c24] 24. The method of claim 21, wherein the cement is API Class A cement, API Class B cement, API Class C cement, API Class G cement, or API Class H cement.
- [c25] 25. The method of claim 21, wherein the cement is ASTM class I cement, ASTM class II cement, ASTM class III cement, ASTM class IV cement, or ASTM class V cement.
- [c26] 26. The method of claim 21, wherein the particles are silica sand.
- [c27] 27. The method of claim 21, wherein the particles are aluminum silicate, gilsonite, ground coal, adamantane, or fullerene.
- [c28] 28. The method of claim 21, wherein the particles are present at a concentration of about 30 weight percent to

about 100 weight percent, based on the weight of the cement.

[c29] 29. The method of claim 21, wherein the composition further comprises sand.

[c30] 30. The method of claim 21, wherein the composition further comprises gravel.

[c31] 31. A method of preparing a cement structure, the method comprising:
providing a cement composition comprising water, cement, and low reactivity particles, wherein the particles have a size of about 40 mesh to about 250 mesh;
shaping the composition into a structure; and
allowing the structure to set.

[c32] 32. The method of claim 31, wherein the composition fractures in a non-linear manner when set.

[c33] 33. The method of claim 31, wherein the water is present at a concentration of about 30 weight percent to about 150 weight percent, based on the weight of the cement.

[c34] 34. The method of claim 31, wherein the cement is API Class A cement, API Class B cement, API Class C cement, API Class G cement, or API Class H cement.

- [c35] 35. The method of claim 31, wherein the cement is ASTM class I cement, ASTM class II cement, ASTM class III cement, ASTM class IV cement, or ASTM class V cement.
- [c36] 36. The method of claim 31, wherein the particles are silica sand.
- [c37] 37. The method of claim 31, wherein the particles are aluminum silicate, gilsonite, ground coal, adamantane, or fullerene.
- [c38] 38. The method of claim 31, wherein the particles are present at a concentration of about 30 weight percent to about 100 weight percent, based on the weight of the cement.
- [c39] 39. The method of claim 31, wherein the composition further comprises sand.
- [c40] 40. The method of claim 31, wherein the composition further comprises gravel.